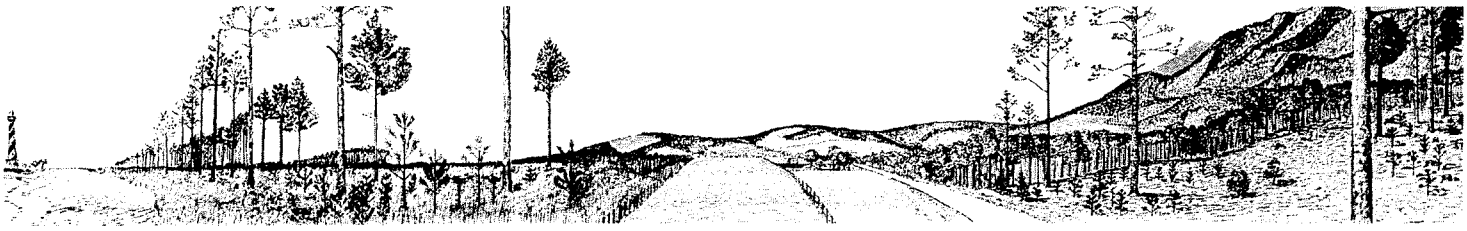

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LENGTH AND RATE OF INDIVIDUAL PARTICIPATION IN VARIOUS ACTIVITIES ON RECREATION SITES AND AREAS

Abstract. --While statistically reliable methods exist for estimating recreation use on large areas, they often prove prohibitively expensive. Inexpensive alternatives involving the length and rate of individual participation in specific activites are presented, together with data and statistics on the recreational use of three large areas on the National Forests. This information can serve to improve objective use estimation on such areas and fill a void in the recreation planner's managerial knowledge.

In recent years several sampling techniques have been developed and tested for estimating amount and kind of use that occurs on a wide variety of recreation sites and areas. Most of these sampling techniques, which follow recommendations of the Recreation Advisory Council Study Committee Number Two,[1] generate estimates of visits,[2] total use, and use by activity in terms of visitor-days.[3] Such efforts have been well directed in that the visitor-day concept affords a use measure providing commonality and additivity and is easily definable over a broad array of recreation experiences.

There are other measures relating to recreation use, however, which have not been stressed but which can be important to on-the-ground planners and managers. Two such measures, generally unprovided by current methodology, concern the number of participants engaging in specific activities and the length of time given to these activities.

The implications of such information are of more than passing interest. These use-related measures can be employed to yield better estimates of visitor-days, though not on a statistical basis. Further,

[1] Recreation Advisory Council Study Committee Number Two. A uniform method for measuring and reporting recreation use on the public lands and waters of the United States. 1965. (Unpublished final report on file at Southeast. Forest Exp. Sta., USDA Forest Serv., Asheville, N. C.)

[2] The entry of any person into a site or area of land or water, generally recognized as providing outdoor recreation. Visits may occur either as recreation visits or nonrecreation visits.

[3] Recreation use which aggregates 12 person-hours. A visitor-day may be comprised of use by one person for 12 hours, 12 persons for 1 hour, or any equivalent combination of individual or group use, either continuous or intermittent.

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while visitor-day figures gauge extremely well the total impact on a recreation site or area, they may not gauge site occupancy and thus may not completely describe the manner in which the site is utilized. When visitor-days are known, realistic measurements of the rates of participation in specific activities can be used to determine estimates of the number of participants in each activity, which may be more easily interpreted by the public than visitor-days. In planning administrative workloads, designing and developing new recreation sites, and providing information to the public, recreation planners and managers will likely find information concerning length and rate of individual participation in various activities to be helpful. Specifically, managers want to know which of the available activities are engaged in by many people, which by few people, and for what amounts of time. These measures will also serve to broaden planning horizons by affording recreation planners information on long-term users and users of dispersed areas in addition to existing information on short-term users and users of developed sites. Information of this nature, generally obtainable through some type of interview sampling effort, is shown in table 1.

The information presented in table 1 was derived from a sampling model designed and tested in 1966 to estimate mass and dispersed types of recreation use on large areas.[4] The sampling model (called the cordon model) incorporates exit sampling, whereby parties are personally interviewed at established checkpoints as they leave recreation areas. This method enables interviewers to obtain such information as length of stay, number of persons in party, and the number of hours spent in a variety of activities. The model was first used from June 13 through October 8, 1966, on the Pacific Ranger District, Eldorado National Forest, California. Since then it has been applied from June 15 through September 4, 196'7, on the Bridgeport Ranger District, Toiyabe National Forest, California-Nevada, and on the Flaming Gorge National Recreation Area, Ashley National Forest, Utah-Wyoming from May 15 through September 9, 1969. Interviews were obtained from 7,186 recreationists on the Pacific Ranger District, 10,219 on the Bridgeport Ranger District, and 8,144 on the Flaming Gorge National Recreation Area.

While considerable variation occurred in water-oriented activities because of the different types and amounts of water development in each of the areas, estimates of rate and length of individual participation are quite uniform for many of the activities on the three areas. Although other areas in unsampled locations may well produce markedly different estimates of rate and length of participation for some activities, the number of observations for each of the three locations is sufficiently large that the data can perhaps serve as rough limits for estimates on unsampled areas.

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[4] James, George A,, and Henley, Robert K. Sampling procedures for estimating mass and dispersed types of recreation use on large areas. Southeast. Forest Exp. Sta., U. S. Forest Serv. Res. Pap. SE-31, 15 pp. 1968.

Table 1.--Estimates of length and rate of individual participation in various activities for three large areas on National Forest lands

Activity	Pacific Ranger District			Bridgeport Ranger District			Flaming Gorge National Recreation Area			All areas combined		
	Persons engaged in activity	Participation		Persons engaged in activity	Participation		Persons engaged in activity	Participation		Persons engaged in activity	Participation	
		Rate[1]	Mean length[2]		Rate[1]	Mean length[2]		Rate[1]	Mean length[2]		Rate[1]	Mean length[2]
	Number	Percent	Hours	Number	Percent	Hours	Number	Percent	Hours	Number	Percent	Hours
Total engaging in one or more activities	7,186	100.0	19.7	10,219	100.0	17.0	8,144	100.0	24.6	25,549	100.0	20.2
General activity in vicinity of overnight quarters	1,429	19.9	10.1	2,729	26.7	5.6	1,474	18.1	9.6	5,632	22.0	7.8
Picnicking, developed sites	107	1.5	1.8	212	2.1	1.8	369	4.5	1.5	688	2.7	1.6
Picnicking, dispersed areas	744	10.4	1.7	1,341	13.1	1.6	605	7.4	1.4	2,690	10.5	1.6
Fishing	2,461	34.2	5.8	5,169	50.6	5.6	4,398	54.0	5.9	12,028	47.1	5.8
Boating, power	149	2.1	5.5	437	4.3	3.3	2,348	28.8	4.9	2,934	11.5	4.7
Boating, nonpower	225	3.1	4.7	132	1.3	3.7	475	5.8	4.1	832	3.2	4.2
Swimming, developed sites	18	.3	2.5	150	1.5	2.0	966	11.9	2.8	1,134	4.4	2.7
Swimming, dispersed areas	1,161	16.2	3.7	374	3.6	1.8	751	9.2	2.8	2,286	8.9	3.1
Watching recreation activities on water	84	1.2	2.8	204	2.0	1.3	957	11.8	1.5	1,245	4.9	1.6
Watching recreation activities on land	175	2.4	1.8	35	.3	1.7	197	2.4	1.4	407	1.6	1.6
Nature study	70	1.0	1.9	968	9.5	.2	819	10.0	1.5	1,857	7.3	.8
Gathering forest products	362	5.0	1.6	862	8.4	1.9	295	3.6	1.2	1,519	5.9	1.7
Team sports, developed sites	5	.1	2.0	0	0	0	25	.3	2.7	30	.1	2.6
Team sports, dispersed areas	24	.3	1.9	9	.1	2.4	23	.3	1.6	56	.2	1.8
Hunting	1,114	15.5	7.7	33	.3	8.2	47	.6	4.1	1,194	4.6	7.6
Road travel, motor	7,186	100.0	1.1	[3]8,298	81.2	.9	[3]3,103	38.1	1.3	[3]18,587	72.8	1.0
Road travel, nonmotor	227	3.2	.9	87	.8	1.8	56	.7	1.7	370	1.4	1.2
Trail travel, motor	279	3.9	2.5	87	.8	2.3	29	.4	7.0	395	1.5	2.8
Trail travel, nonmotor	1,386	19.3	3.7	1,504	14.7	3.5	320	3.9	1.3	3,210	12.6	3.4
Off-road, off-trail motor travel	48	.7	2.0	83	.8	2.9	50	.6	3.1	181	.7	2.7
Off-road, off-trail nonmotor travel	639	8.9	3.4	669	6.5	2.8	387	4.8	1.4	1,695	6.6	2.7
General leisure	1,484	20.7	3.2	4,982	48.8	4.0	3,456	42.4	3.2	9,922	38.8	3.6
Viewing exhibits	0	0	0	125	1.2	.5	1,419	17.4	1.3	1,544	6.0	1.2

[1] Participation rate is determined by dividing the number of persons engaging in all combined activities into the number of persons engaging in the activity for which the participation rate is desired and then multiplying by 100.

[2] Represents mean length of stay per person per entry, excluding time spent sleeping. This statistic is determined solely from interview data and is not related to the regression use estimates of the cordon model.

[3] All interviewed persons engaged in road travel by motor. Activities which were pursued for less than 1 hour, however, were not recorded.

One item of particular interest is the relatively high rate of participation in picnicking and swimming on dispersed areas. These two activities have generally been thought to occur primarily on developed sites. This activity indicates, perhaps, that many people prefer a less crowded and less regimented experience, a factor which should be considered in striving to meet the needs of the recreating public.

Another valuable use of such estimates lies in the determination of the activity pattern. This information, if collected periodically on selected sites and areas offering a wide range of recreational activities, may signal changes in trends and patterns of use.

One of the most potentially important uses of such data lies in generating annual estimates of recreation use for individual sites and areas where statistical sampling is impractical. Such estimates for the majority of sites and areas, whether in public or private ownership, are generally based on subjective methods and are oftentimes grossly in

error. A common method of nonstatistical estimation is to multiply an estimated mean of the length of stay by some type of visitor count to arrive at visitor-days of use. In general, subjective estimates of numbers of visits are better "ball park" estimates than are length-of-stay estimates because managers, by observational and mechanical means, can determine number of persons more reliably and inexpensively than length of stay. Consequently, when reliable estimates of average length of stay are available, better estimates of use will result than those heretofore obtained by purely subjective means.

Many managers may feel that the estimates of participation in table 1 are adequate for providing reasonably valid statistics of use when coupled with reliable visitor-counts. The conscientious manager, however, will verify that these rates apply to his area before he uses them. Others may choose to develop their own estimates, which might be more applicable locally. Whether the choice is to verify application of the figures in table 1 or to develop new ones, an extensive and highly structured interview is not the only alternative. Other, less formal techniques which may be used include brief oral interviews, simple observation, administrative studies with observations made on randomly selected days, and the relation between participation and length-of-stay measures on use-calibrated areas and on similar, unsampled locations.

A simple formula employing length-of-stay measures takes the form:

Number of participants $\dot{x}$ average length of stay

= visitor-hours of use

Managers using the suggested technique are reminded that length-of-stay estimates must be based only on the presence of people and not on the presence of unattended gear.

The comments and methodology presented here should not, in any event, be interpreted as a suggested replacement for statistically sound procedures. However, estimates of length and rate of individual participation can introduce greater objectivity into nonstatistical procedure, particularly after existing estimates are bolstered by additional data from both public and private ownerships. In this way, such estimates can provide an increasingly useful tool for the improved management of recreation systems.

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